VOL. XXIV. No. 1 January, 1917

THE PSYCHOLOGICAL REVIEW

THE RELATION OF INTELLIGENCE TO SOCIAL STATUS

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HISTORICAL

Among the many reports of investigations with the Binet-Simon scale incidental references to the influence of social status on intelligence are occasionally found; but heretofore the study of this extremely important and interesting topic has been relatively neglected, although Binet with his usual acumen did not overlook the problem.

In 1910 Decroly and Degand[1] tested forty-five children of both sexes in a private school at Brussels. They found that none of the children tested were below age, nine were at age, and the rest from one to three years above the level of their age. These results were very significant, since the Binet-Simon scale is theoretically supposed to rate equal numbers retarded and advanced with the mode and the average at age.

Decroly's and Degand's results were carefully studied by Binet.[2] He thought the best explanation of the difference between his results and theirs was found in the fact that the Belgian children came from a private school in Brussels and represented children of the well-to-do and largely professional class while the Paris children were from a rather poor section

[1] Decroly, O., et Degand, Mlle. J., 'La Mesure de l'intelligence chez des enfants normaux d'après les tests de MM. Binet et Simon,' *Arch. de psychol.*, 1910, 9, 81–108.

[2] Binet, A., et Simon, Th., 'Nouvelles recherches sur la Mesure du Niveau Intellectual chez les enfants d'école,' *L'Année Psychol.*, 1911, 17, 145–201.

of the city. The instruction in the Belgian school was also more individual for the classes were very small.

In analyzing the Brussels results by the individual tests, Binet found that the children from the better social class scored higher in tests involving thought in the higher sense—apprehension, criticism, comparison, etc. They also scored higher than the less favored children in the tests which put a premium on linguistic readiness—such as the description of pictures, abstract definitions, comparison of objects, absurdities, and giving words for three minutes. Binet concluded that social status must be closely correlated with mentality and reckoned from the results in the two schools an average difference of about one and one half years between children of the better and poorer social classes. He does not take into account, however, that this difference may vary with different chronological ages.

Binet, moreover, criticized[1] the work of Katharine Johnston, who had examined two hundred pupils of the Sheffield schools in England, because she had drawn her subjects from at least three distinct social groups and had not kept these groups separate in her averages.

Another study which seemed to confirm Decroly's and Degand's results was the testing done by M. Morlé[2] in a school in a poor part of Paris and compared with the results from a school situated in a wealthy section. The study was on a rather small scale as only thirty children were taken, at random, from each school. The results were as follows:

	Retarded		At Age	Advanced	
	2 Yr.	1 Yr.		1 Yr.	2 Yr.
Unfavored school	1	11	13	4	1
Favored school	1	3	10	10	6

Thus sixteen children out of the thirty tested were advanced in the favored school while only five were advanced in the unfavored school. The children from the poorer

[1] *L'Année psychol.*, 1911, 17, 195–196.

[2] Morlé, M., 'L'influence de l'état social sur le degré de l'intelligence des enfants,' *Bull. Soc. libre Educ. Psychol. de l'enfant*, 1911, 12, 8–15.

section were on the average about one fourth year behind the level of their age, while those of the favored school averaged from one fourth to one half year advanced, or a difference of about three fourths of a year between the two social classes.

In 1910 the teachers of the Breslau schools in Germany made a comparative study of children of different social classes there. The demand for a common school for all classes to replace the Vorschule and Volkschule had arisen in Germany. The Volkschule is the elementary public school attended by the children of the laboring and lower business classes, while the Vorschule is attended by the children of the higher social classes. In Prussia the children could enter the Gymnasium, which has a nine-year curriculum preparing for the university after three years of preparation in the Vorschule but only after four years in the Volkschule. The purpose of this investigation was to find whether the mental maturity of the child, as well as the curriculum, justified this. One hundred and fifty-six boys were tested from the two schools. The Binet-Simon scale modified by Bobertag was used. The boys tested were seven and nine years of age from the Vorschule and seven, nine, and ten years from the Volkschule. It was found that the nine-year Volkschule pupils scored 10 percent lower than the pupils of the same age in the better school, while the ten-year-old Volkschule boys attained only the average of the nine-year-old Vorschule pupils. The difference in average was due largely to the fact that the Vorschule pupils did nearly twice as well as the Volkschule pupils of the same age in tests above their age level. The tests at the age level were passed about equally well by both schools. This raises the question of whether children of higher social classes mature earlier than those of the lower levels.[1]

Children from three very different environments were tested in 1911 by J. and R. Weintrob.[2] There were about sev-

[1] Hoffman, A., "Vergleichende Intelligenzprüfungen an Vorschülern und Volkschülern," *Zsch. f. Angew. Psychol.*, 1914, 8, 102–120.

[2] Weintrob, J. and Weintrob, R., "The Influence of Environment on Mental Ability as Shown by the Binet-Simon Tests," *J. of Educ. Psychol.*, 1912, 3, 577–583.

enty children of both sexes in each group tested. Group *A* consisted of children from a school attended by children of the wealthy class, with every opportunity for travel, etc. Group *B* was composed of children whose fathers were wage-earners or small business men. Group *C* was composed of children from a Hebrew Orphan Asylum with no real home environment. The schools were compared as to the number of children, testing above, at, or below the norm for their age, using the Binet-Simon scale. The *A* group was found to rank highest, the *C* group next and the *B* group last. The investigators state: "Judging from the results environment does not seem to affect greatly mental capacity, if at all." Instead of the schools ranking *A* and *B* and *C* as might have been expected, the C school or Jewish Orphanage ranked a close second to the wealthy school. However, the question of race enters very largely in this study as the children of the Asylum were all Jewish, while those of Group *A* were predominantly American with a few Germans, Jews and Italians, and Group *B* was largely composed of Germans, Italians and some American children. It is very evident, as the investigators say, that in order to judge fairly differences in environmental influences among groups, the conditions within each group must be uniform, and the same races must be judged.

A study involving social status, incidentally, was made in Columbia, S. C. by Miss Strong.[1] Her primary purpose was to investigate the difference between the white and negro children but in order to make a fair comparison she tested white children in both the city schools and in the mill district. The results show that less than six percent of the city school children were retarded while eighteen percent of the mill district children were mentally over a year below the level of their age. None of the mill district children were above their age level, although ten percent of the city children scored above their years. Approximately the same percent of the children in each district were at the level of their age; eighty-four percent in the city schools and eighty-one per-

[1] Strong, A. C., '350 White and Colored Children Measured by the Binet-Simon Measuring Scale of Intelligence; A Comparative Study,' *Ped. Sem.*, 1913, 20, 485–513.

cent in the mill district schools. Practically the same course of study was used in the schools of both districts.

One of the most recent investigations on the subject of social status was made by Yerkes and Anderson[1] in Cambridge, Mass. In this investigation the Yerkes-Bridges Point Scale[2] was used. Fifty-four children in the kindergarten and first grade of school *A* were compared with children of the same sex and approximately the same age in school *B*. School *A* is located in a good neighborhood and the sociological status of almost all the pupils is very good. School *B* on the contrary is located in a medium to poor section of the city and the majority of its pupils live in a rather poor environment. The children compared were all of English-speaking parents.

The average number of points scored in the two schools is indicated below:

	Age				
	4 Yrs.	5 Yrs.	6 Yrs.	7 Yrs.	8 Yrs.
School *A*	15	27	42	49	56
School *B*	17	22	29	35	41

The favored school averages much higher except in the four-year group. The very young children of the unfavored group seem to have the advantage here, probably because they are less timid. The results show that there is a difference of from twenty percent to thirty percent in mental ability which may be associated with differences in sociological status.

The authors point out that in view of a difference so marked between children of different sociological levels, it is very unfair to judge them by the same norm and that further investigating should be done with the view of establishing norms for different social levels.[3]

[1] Yerkes, Robt. and Anderson, Helen, 'The Importance of Social Status as Indicated by the Results of the Point Scale Method of Measuring Mental Capacity,' *J. of Educ. Psychol.*, 6, No. 3, Mar., 1915.

[2] Yerkes, Bridges and Hardwick, 'A Point Scale for Measuring Mental Ability,' Warwick and York, 1915. Hereinafter referred to as the "Point Scale."

[3] In a book published since this paper was written, Prof. L. M. Terman discusses the influence of social status. He reports a difference of one to two years between the superior and inferior classes—a result in close conformity with those mentioned above. 'The Measurement of Intelligence,' pp. 72 and 115, Warwick and York, 1916.

Experimental

The Yerkes-Bridges Point Scale was used in this investigation and three hundred and one children were tested in two schools situated in very different localities of Columbus, Ohio. The children from school *A* situated in the better district will be designated as the favored group, while those of school *B* will be designated as the unfavored group.

School *A* is in a very good residence section near the university. The majority of the people own their homes, which are surrounded by well-kept lawns. A portion of the university campus, as well as many wooded lots afford ample playground for the children. The school building is modern in every respect, having been completed about six years ago. The children of the first and second grades spend alternate half hours in a well-equipped Portable where their play is supervised by a teacher who has specialized in this work. This school is considered one of the most desirable in which to teach in the city and only well qualified teachers obtain the positions.

The chief occupations of the fathers of the children in this district were managers, proprietors and officers of manufacturies and stores, traveling salesmen, real estate and insurance agents, and a professional group composed of professors, doctors, lawyers, architects, and ministers. A more complete analysis and grouping of the data by the occupations of the fathers will be given later in this paper. All the children of the first and second grades were tested, and as time did not permit completing the third grade, the children were taken alphabetically. All the children in the grades tested were American born and of English-speaking parents. The testing was done in a hall where occasionally some one passed but otherwise there was no disturbance; and no third party was present when the examination was made. The child's name, date of birth and father's occupation were recorded in every case and checked by the teacher's record.

School *B* is situated near the railroad in a poor factory district of Columbus. The houses average about four or five rooms and are usually built very near the street. They are

often in very bad repair, having been in that part of Columbus which was flooded three years ago. The usual rent is from $8 to $10 a month. Where there are yards they are so ill-kept and muddy that the street is the common playground for the children. The school house is old and has no inside toilet facilities or up-to-date equipment. There is one saloon on the corner opposite the school building and two others within a block and a half of it. The fathers, if still in the family, are receiving low and irregular wages and almost one half of the fathers of the children in this district belong to the unskilled and casual labor group. The remainder were in the more skilled mechanical trades or were teamsters or delivery men. The mothers are often away all day working in the factories or doing laundry work to supplement the husband's income, or in many cases to support the family entirely. The parents have little idea of the value of education and the children often stop school and go to work as soon as they can secure their working papers. The Associated Charities say that probably 50 percent of the families in this district are registered with some kind of philanthropic organization. The children are often very poorly clad, far from clean and frequently undernourished. Many of the teachers in this school are young and have not taught a great while.

In the case of several children scoring lowest, other members of the family were tested. In five cases the mothers scored only from 47 to 54 points or a mental age of about eight years, and sisters and brothers were far below their age level.

The negroes and children of non-English speaking parents were excluded in this school, but every other child in the first, second and third grade was tested, making a total of 136 children. The testing was done in a small room free from all disturbing elements.

In both schools the tests were given during school hours by one examiner[1] and in all cases doubtful credits were discussed and decided upon by the authors jointly. The child's

[1] Miss Coler.

age to the nearest month was determined by subtracting the date of the birth from the date the tests were given. A given age group includes all children from the middle of the year below to the middle of the one above. Thus, in the group of six-year-olds are included all boys (or girls) from five years seven months to six years six months, inclusive.

Results

The results for the total 301 Columbus school children will first be considered and their scores compared with the scores for Cambridge, Mass., school children of the same ages. These results are presented in Table I. The first

Table I

Age	Columbus			Cambridge			
				English		Non-English	
	No.	A.	M.	No.	A.	No.	A
6	37	34.1	33	55	29	16	27
7	97	42.8	45	48	35	25	31
8	81	54.7	55	47	41	14	37
9	59	57.3	59	43	56	31	48
10	14	55.9	56	53	62	23	56
11	7	49.6	50	55	65	24	62
12	5	54.8	55	40	77	20	67

A.—Average.
M.—Median.

column gives the ages, the second the number of Columbus children tested at each age, the third and fourth the average and the median scores for Columbus children at each age, while columns five and six give for comparison the number and average scores for Cambridge children of English-speaking parents and columns seven and eight the same for children of non-English-speaking parents.[1]

The results are shown graphically in Fig. 1. Graph *A* is for Columbus children, both schools combined; Graph *B* for Cambridge, English-speaking group, and *B'* for Cambridge, non-English-speaking group. After nine years the number of Columbus children at each age is very small and after ten years composed of children from the unfavored school alone.

[1] Point Scale, pp. 66–67.

This selection is clearly shown by the drop in the curve after nine years, and is due to the fact that in our present school system a child is behind if he is over nine years of age and in the third grade.

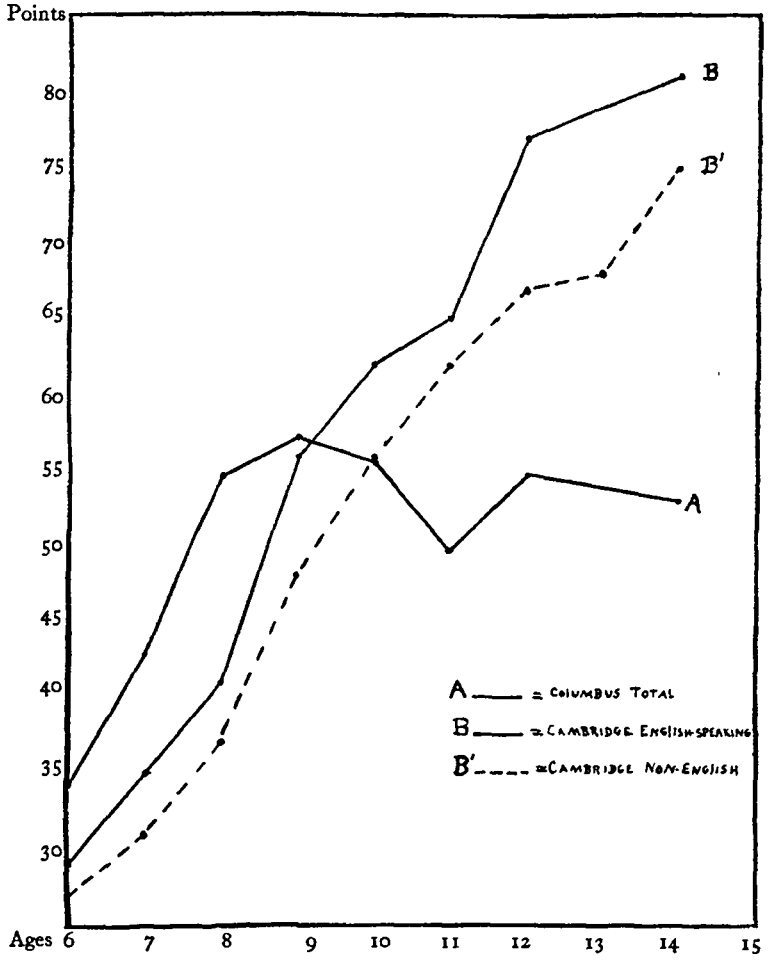


FIG. 1.

The most striking feature in these results is the evident superiority of the Columbus children up to ten years; but it will be shown in the sequel that their superiority is entirely due to the influence of the favored group and that when the

groups are separated the correspondence between the children of the two cities is even closer than might have been expected.

TABLE II

		Ages				
		6 Yr.	7 Yr.	8 Yr.	9 Yr.	10 Yr.
Cambridge Heterogeneous	Number	71	73	61	74	76
	Score	29	34	39	52	59
Total Columbus	Number	37	97	81	59	14
	Score	34.1	42.8	54.7	57.3	55.9
Combined Average	Number	108	170	142	133	90
	Score	30.7	39.0	48	54.4	58.5

The Columbus results from the sixth to the tenth year inclusive may be combined with the Cambridge results for the same ages to help in the standardization of the scale.

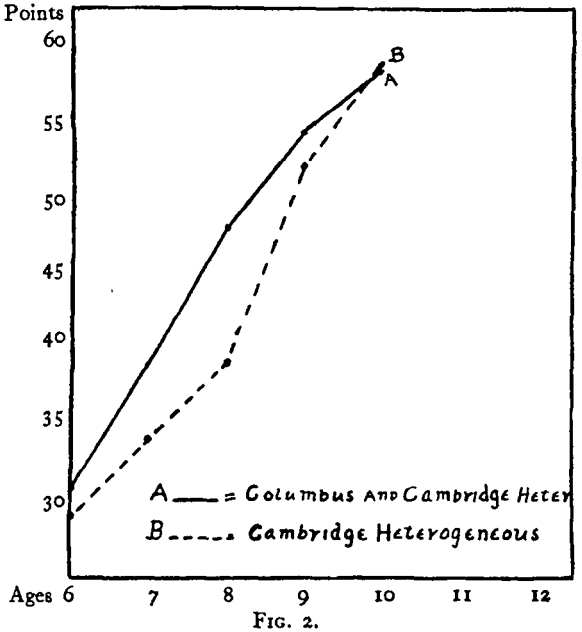


FIG. 2.

At first the Columbus results were combined with the Cambridge heterogeneous group[1] in the following way. The number of children at each age in the group was multiplied by the average score of that age for Columbus and Cambridge

[1] Point Scale, pp. 64–65.

separately. Then these results were added and divided by the total number at that age. Table II. shows the average score and number of pupils at each age in each group and the combined averages or new norms obtained. The latter are also shown graphically in Fig. 2. The solid line represents the combined norm for the total 643 children of Columbus and

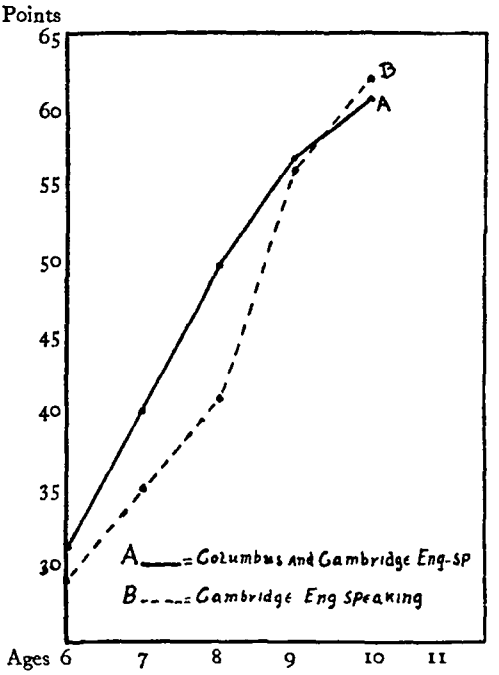


FIG. 3.

Cambridge; and the dotted line is the original norm from six to ten years for the 355 Cambridge children alone.

As all the children tested in the Columbus schools were of English-speaking parents it seemed fairer to use as a standard for judging the Columbus pupils a norm made from the Columbus results combined in the same way with the Cambridge group of children of English-speaking parents,[1] instead of the heterogeneous group.

These norms are shown in Table III. and graphically in Fig. 3. In this case the solid line represents the combined

[1] Point Scale, pp. 66–67.

norm for 245 Cambridge children of English-speaking parents and 288 Columbus children, or a total of 534 children. The broken line shows the original norm for the Cambridge English-speaking group alone. Selection entering after nine years in the Columbus results will explain the slight drop in the solid curve from nine to ten years. This curve was used as a norm for determining the mental age and coefficient of

TABLE III

		Ages				
		6 Yr.	7 Yr.	8 Yr.	9 Yr.	10 Yr.
Cambridge English-speaking	Number	55	48	47	43	53
	Score	29	35	41	56	62
Total Columbus	Number	37	97	81	59	14
	Score	34.1	42.8	54.7	57.3	55.9
Combined Average	Number	92	145	128	102	67
	Score	31.1	40.2	49.7	56.8	60.7

mental ability of the Columbus children. For scores above or below the six, seven, eight, nine and ten year averages the norm for the English-speaking group of Cambridge alone had to be used.

COMPARISON OF DIFFERENT SOCIAL GROUPS

The Columbus results from Schools *A* and *B* will now be compared. Tables IV. and V. show the individual scores by sex and age for the favored and unfavored schools respectively. The average score for each age and each sex and also for both sexes combined are likewise given in each table.

These results are shown graphically by Fig. 4, curves *A* and *B*. The favored school is from 21 percent to 32 percent superior to the unfavored school varying with the chronological age. The curve drops at nine years in School *A* and at ten years in School *B*, showing that the selection previously mentioned enters earlier in the former. After ten years the numbers in the unfavored group are very small and the scores are not representative of these age groups.

As these results are very similar to those found in the Cambridge investigation it is interesting to compare them

TABLE IV

FAVORED *A*

6		7		8		9		10	
(8) M.	(9) F.	(36) M.	(23) F.	(26) M.	(27) F.	(16) M.	(14) F.	(2) M.	(4) F.
	....			. ..			....		
29	31	22	32	49	36	44	54	66	39
30	36		.. .	51	41	....	55	68	
....		34	36	51	....	50	61		49
36	39	35	38	52	45	52	62		64
	39	35	40	52	49	56	63		75
40	41	....	43	52	49	60	63		
42	42	40	45	53	51	61	65		
47	43	41	45	53	51	62	65		
47	....	42	49	55	55	63	67		
48	52	43	49	55	55	64	68		
....	54	45	49	55	55	64	68		
		47	49	56	56	66	71		
		47		58	57	69			
		47	50	58	58	69	72		
		48	51		59		73		
		48	51	60	59	73	....		
		48	51	62		77			
		49	52	63	60	79			
			52	64	60	....			
		50	52	65	62				
		50	53	66	63				
		52	53	66	63				
		54	55	67	65				
		54	59	69	66				
		54	....	72	67				
		54	67	. ..	67				
		55		75	69				
		55		76	71				
		56			73				
		56			....				
		58							
		58							
		59							
		60							
		....							
		64							
		64							
		66							
		71							
		72							
Ave.....39.8	41.9	48.1	48.7	59.8	57.9	63.1	64.8	67	56.8
40.9		48.4		58.8		64		60.2	

—— = 25 percent above or below general norm.

.... = 25 percent above or below group norm.

TABLE V

UNFAVORED *B*

6 Yr.		7 Yr.		8 Yr.		9 Yr.		10 Yr.		11 Yr.		12 Yr.		14 Yr.
(14) M.	(6) F.	(24) M.	(14) F.	(14) M.	(14) F.	(11) M.	(18) F.	(4) M.	(4) F.	(6) M.	(1) F	(3) M.	(2) F.	(1) M.
					....			....	....					
16	17	14	19	22	35	35	24	43	45	36	46	46	55	53
21	....	21	22	25		35	....			48		53		
....	23	25	22	27	38	....	42	54	50			57	60	
22		25	24	....	42	38		57	52	50				
23	28	26	....	36	44		44	60	61	55				
23	29	26	28		45	43	44	....	....	58				
	29	....		39	48	47	46			72				
25		27	34	44	49	49	47							
25	....	27	37	45	49	52	50							
25	42	28	37	45	51	53	50							
26		29	43	46	52	58	51							
29		29	....	48	57	58	53							
33		29	44	50	57	59	54							
34			45	52	57		54							
....		32	45			....	58							
		32		....	....		59							
39		35	54	62	68		61							
55		37	58	62			61							
		40					....							
		41					67							
		41												
		42					75							
		43												
		....												
		44												
		50												
		54												
Ave.....28.3	27.2	33.2	36.6	43.1	49.4	47.9	52.2	53.5	52	53.2	46	52	57.5	53
28.3		34.4		46.2		50.1		52.8		52.1		54.2		53

—— = 25 percent above or below general norm.

.... = 25 percent above or below group norm.

with the two similar groups there.[1] Table VI. shows these results and they are also shown graphically in Fig. 4. Only the kindergarten and the First Grade were tested in the Cambridge favored school so the curve is short.

TABLE VI

		Favored School					Unfavored School				
	Age.....	6 Yr.	7 Yr.	8 Yr.	9 Yr.	10 Yr.	6 Yr.	7 Yr.	8 Yr.	9 Yr.	10 Yr.
Cambridge..	Score..	42	49	56	.....	.....	29	35	41	56	62
Columbus...	Score..	40.9	48.4	58.8	64	60.2	28.2	34.4	46.2	50.1	52

[1] Point Scale, p. 74, p. 66.

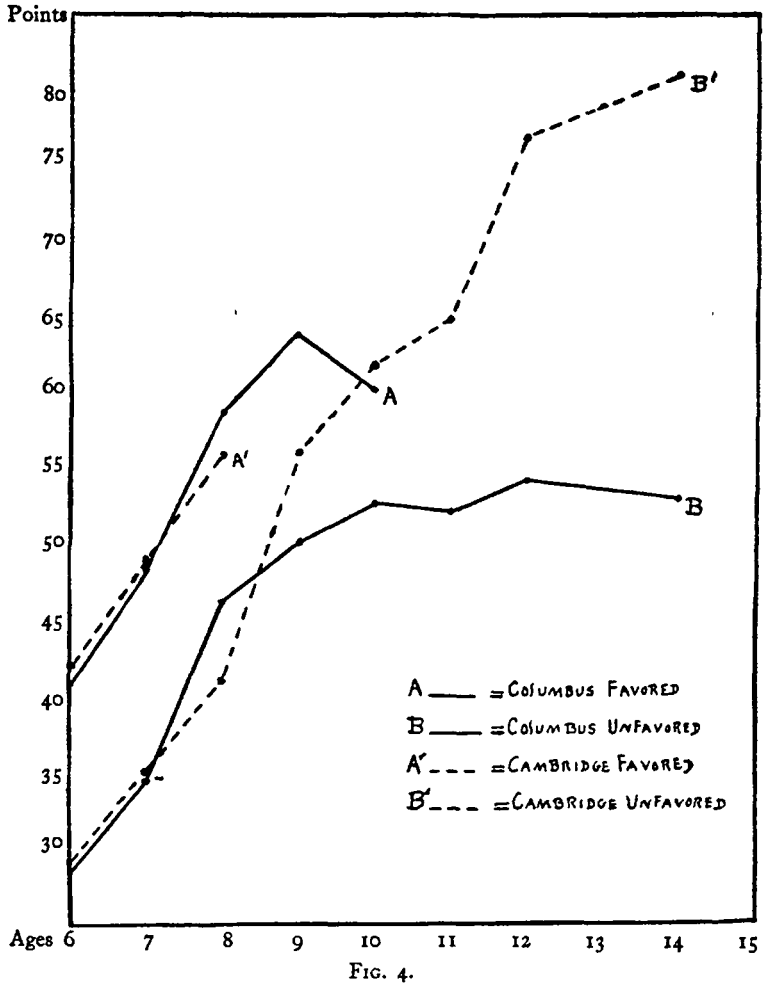


FIG. 4.

TABLE VII

		School *A*		School *B*	
		M.	F.	M.	F.
Cambridge.....	No...	11	13	29	26
	Score.....	42	40	29	30
Columbus.....	No..	8	9	14	6
	Score.....	39.8	41.9	28.3	27.2

These differences between the favored and unfavored groups and the striking similarity between the Columbus

and Cambridge results are even more clearly shown by the data for the six-year-old groups given in Table VII.

Comparison of Sexes

Tables IV. and V. should be consulted for the individual scores. The averages for boys and for girls in both schools combined are shown in Table VIII.

Table VIII

	6 Yr.	7 Yr.	8 Yr.	9 Yr.	10 Yr.
Males	32.5	42.2	54	56.9	58
Females	36.3	44.1	55	57.7	54.4

Fig. 5 shows these results graphically. The superiority of the girls over the boys seems marked up to ten years. By examining Table IX. and Fig. 6, which give the averages for

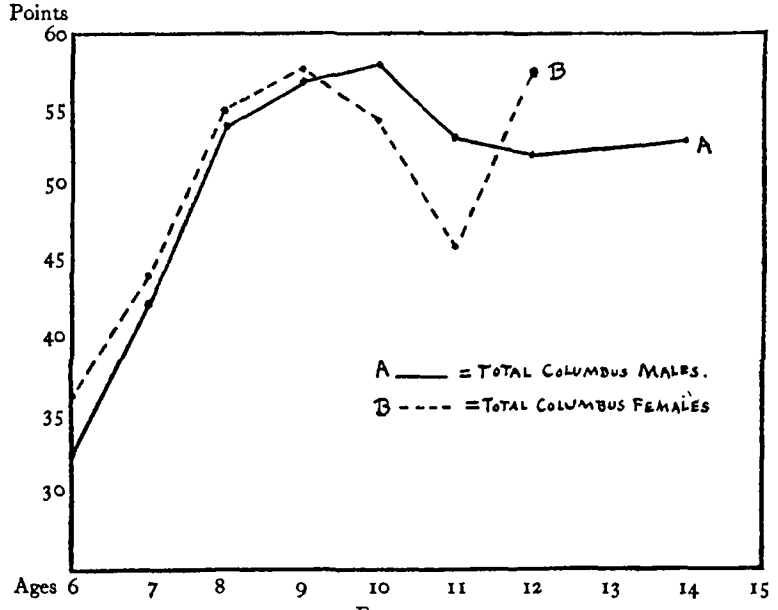


Fig. 5.

each sex in each school separately it will be seen that this superiority of the girls is brought about almost entirely by the girls of the unfavored school.

TABLE IX

	6 Yr.		7 Yr.		8 Yr.		9 Yr.		10 Yr.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Unfavored.....	28.3	27.2	33.2	36.6	43.1	49.4	47.9	52.2	53.5	52
Favored.. . .	39.8	41.9	48.1	48.7	59.8	57.9	63.1	64.8	67	56.8

The difference between the sexes is particularly marked in the eight-year group of the unfavored school, where there is an equal number of boys and girls. At the same age in the favored school the boys have the advantage. These

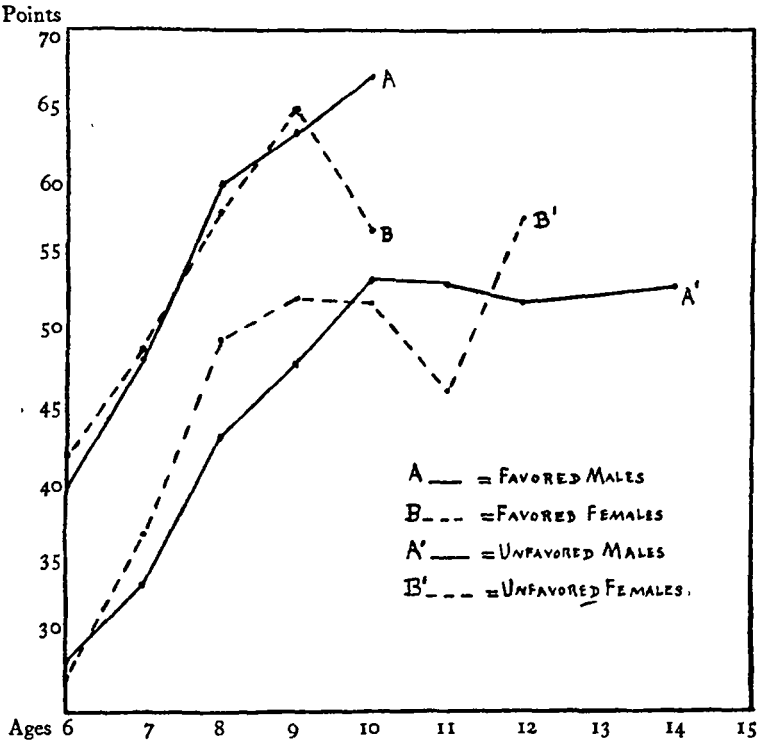


FIG. 6.

results seem to bear out the theory held by Thorndike[1] and others that females deviate less from the norm than males; for there is less difference between the performances of the girls in the two schools than there is between the performances of the boys.

[1] 'Educational Psychology', second edition, 1910, pp. 33–43.

TABLE X

	First Grade				Second Grade				Third Grade			
	No.	M.	A.	Age	No.	M.	A.	Age	No.	M.	A.	Age
Favored	57	47	45.3	6–7½ mo.	55	55	56.2	7–8 mo.	53	64	63.5	8–8½ mo.
Unfavored ..	52	27.5	29.1	6–9½ mo.	44	45.5	46.2	8–5 mo.	40	54.5	55.1	9–9 mo.
Difference...	...	19.5	15.7	2 mo.	..	9.5	10	4½ mo.		9.5	8.4	1 yr.

M.—Median.

A.—Average.

Age—Chronological age in years and months.

TABLE Xa

First Grade				Second Grade				Third Grade			
Favored		Unfavored		Favored		Unfavored		Favored		Unfavored	
M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
57		52		55		44		53		40	
22	31	14	17	44	36	29	24	50	49	43	44
29	32	16	19	49	39	35	35	52	49	45	45
30	36	21	22	50	41	36	37	52	51	48	46
34	36	21	22	51	45	37	42	53	54	50	46
35	38	22	23	51	49	39	42	53	55	53	50
35	39	22	24	52	49	40	43	56	56	53	50
36	39	23	28	52	49	42	44	58	57	54	50
40	40	23	28	54	51	43	44	60	58	55	51
40	41	25	29	54	51	43	44	60	61	57	51
41	42	25	29	55	51	44	45	61	63	57	52
42	43	25	34	55	52	44	47	62	63	58	53
42	43	25	37	55	53	45	49	62	64	58	54
43	45	25	38	55	55	46	49	63	65	58	54
45	45	25	42	56	55	46	52	64	65	59	55
47	49	26	45	56	55	47	54	64	65	60	57
47	49	26	45	56	55	48	57	64	67	62	58
47	50	26	48	58	59	49	57	66	67	72	59
47	51	27		58	59	50	58	66	68		60
47	52	27		58	60	50	67	67	68		61
48	52	27		59	60	52		68	71		61
48	52	28		63	62	52		69	71		61
48	53	29		64	62	53		69	72		68
48	54	29		65	63	54		69	73		75
49	59	29		66	66	55		72	73		
50	63	32		66	67	62		73	75		
52		32		66	67			76			
54		33		72	69			77			
54		34		75				79			
55		35									
60		35									
64		36									
71		38									
		39									
		41									
		41									
Ave.....45.3	45.4	28.1	31.2	57.7	54.8	45.6	46.8	63.8	63.2	55.4	54.8
45.3		29.1		56.3		46.2		63.5		55	

Comparison of Grades

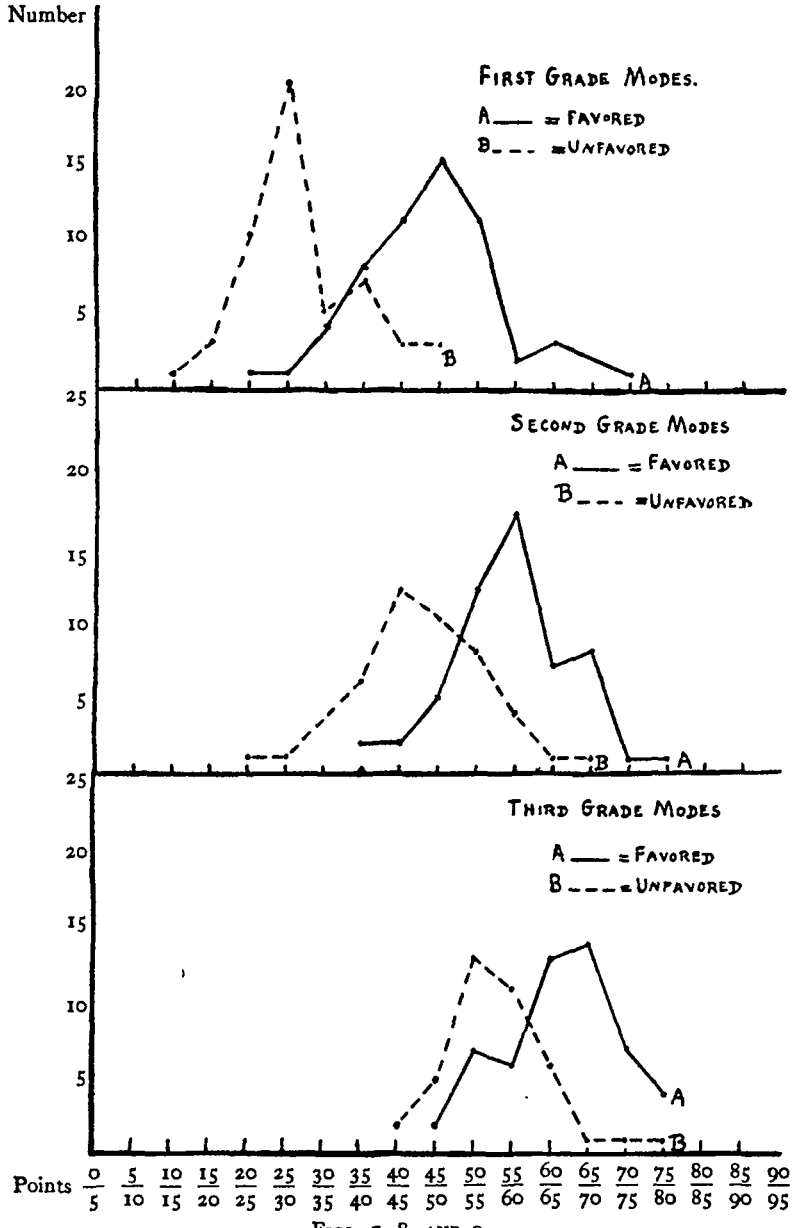
Table X. gives in convenient form the number of pupils, the median and average scores and the average chronological ages for each grade in each school. The individual scores for each school and each grade are given on Table X*a*.

It will be seen that the superiority of the favored school is much greater for the first than for the second or third grades.

By examining the Figs. 7, 8, and 9, showing the modes for the three grades, the same thing will be found to be true. The favored school, first grade, has a mode of from 45 to 50 points and the unfavored school from 25 to 30 points or a difference of 20 points. The difference in the second grade is 15 points and in the third the difference lies between 10 and 15 points as the mode is not distinct here.

These results seem to show that the difference between the children of the two schools is greatest when they enter the school and that it becomes less from grade to grade. This would mean that the school work tended to equalize some of the original difference.

It is necessary, however, to examine further to see if there may be another explanation before accepting this conclusion. The average chronological ages for the three grades are also given in Table X. The ages are nearest the same in the first grade where there is only two months difference, but this difference increases to over a year in the third grade. This age difference is brought about by the fact that in the unfavored school so many children are in a low grade for their years. In our present school system a child enters at the age of six and would therefore be in the third grade at the age of eight to nine years if regularly promoted. Out of the forty children in the third grade of the unfavored school there were eight in the ten-year group, five in the eleven-year group, four in the twelve-year group and one in the fourteen-year group. That is, about 45 percent of the children in that grade are older than they should normally be in the third grade. On the other hand there are only five older than the nine-year group in the third grade of the favored school and none of these is above ten years six months.


Number
FIRST GRADE MODES.
A ___ = FAVORED
B - - - = UNFAVORED
SECOND GRADE MODES
A ___ = FAVORED
B - - - = UNFAVORED
THIRD GRADE MODES
A ___ = FAVORED
B - - - = UNFAVORED
Points 0/5 5/10 10/15 15/20 20/25 25/30 30/35 35/40 40/45 45/50 50/55 55/60 60/65 65/70 70/75 75/80 80/85 85/90 90/95

FIGS. 7, 8, AND 9.

If we now compare the average scores for each age group in the two schools we find that the differences from year to year are fairly constant. These figures are shown in Table XI.

TABLE XI

	6 Yr.	7 Yr.	8 Yr.	9 Yr.	10 Yr.
Favored	40.9	48.4	58.8	64	60.2
Unfavored	28.3	34.4	46.2	50.1	52.8
Difference	12.6	14	12.6	13.9	7.4

The difference is practically the same for the six- and seven-year groups and the decrease at ten years is probably due to selection entering in both schools at this age. Moreover there are too few ten-year-old children for a fair comparison. There is thus very little diminution of the initial difference with age; and the fact that the difference in mental ability between the two schools is less in the second and third grades than in the first, must therefore be largely due to the older children in the second and third grades of the unfavored school who tend to raise the average of points scored in that grade and so make it approach nearer to the favored school's results.

A coefficient of mental ability for each child was obtained by dividing the number of points actually scored by the number of points which should be scored at his chronological age. The standard used was the one obtained by combining the total Columbus results with the results of the Cambridge children of English-speaking parents.[1] The mental age of the child can also be obtained by referring his score to the age at which this score should be obtained.

The average coefficient of mental ability, average mental age and average chronological age for each grade in each school are shown in Table XII.

There is a uniform difference of about a year in the average chronological age of the children from grade to grade in the favored school. On the other hand there is a difference of almost two years between the average chronological

[1] See Table III.

age of the children in the first grade and those of the second grade in the unfavored school. This indicates that the children of the first grade in the unfavored school remain on the average two years in that grade before being promoted. Moreover the mental age for the children of the unfavored school is about a year lower than their actual chronological age. It would therefore seem that the children of the unfavored group are not mature enough mentally when they enter school at the age of six to be able to do the prescribed

TABLE XII

	Favored			Unfavored			Difference		
Grade	I		III	I	II	III	I	II	III
C. A.....	6–7½ mo.	7–8 mo.	8–8½ mo.	6–9½ mo.	8–5 mo.	9–9 mo.	2 mo.	4½ mo.	1 yr. 5 mo.
M. A.....	7–9	9–3	10–4	5–9	7–9	8–11	2 yr.	1 yr. 6 mo.	1 yr. 5 mo.
C. M. A...	1.24	1.26	1.18	.77	.98	.93	.47	.28	.25

C. A., chronological age.
M. A., mental age.
C. M. A., coefficient of mental ability.

work. The children of the favored group, on the contrary, are mentally a year ahead of their chronological age and so these children might equally well enter school at an earlier age and be able to do the required work. It is also interesting to note in this table that although the difference in the mental age between the two schools decreases from grade to grade, the difference in their chronological age increases, thus keeping a fairly constant difference of two years between the schools in the grades tested. Binet estimated that there was a difference of about one and one half years between children of different social classes, and M. Morlé found about a year's difference in the groups he studied in Paris.

COMPARISON OF SEPARATE TESTS

Table XIII. shows the average scores for each of the twenty tests making up the Point Scale. Scores for the favored and unfavored boys and girls are given separately and the combined average and the difference between the schools is also given. The difference, although sometimes very small, is always on the side of the favored school.

TABLE XIII

Test	Fav. Boys	Unfav. Boys	Fav. Girls	Unfav. Girls	Total		Diff.
					Fav	Unfav.	
1	2.90	2.62	2.98	2.91	2.94	2.77	.17
2	3.73	3.18	3.88	3.22	3.8	3.2	.60
3	2.97	2.77	2.98	2.71	2.98	2.74	.34
4	3.18	2.48	3.19	2.67	3.19	2.55	.64
5	3.27	2.02	3.24	2.67	3.26	2.35	.91
6	2.22	1.87	2.20	1.94	2.21	1.91	.30
7	6.76	5.90	6 76	6.	6.76	5.95	.81
8	1.73	1.46	1.54	1.57	1.64	1.52	.12
9	4.58	3.06	4.28	3.59	4.43	3.33	1.10
10	5.42	3.98	5.18	4.64	5.30	4.31	.99
11	2.09	1.48	2.25	1.32	2.17	1.40	.77
12	2.43	2.06	2.27	2.25	2.35	2.16	.19
13	1.51	.78	1.64	1.40	1.58	1.09	.49
14	1.66	.52	1.16	.98	1.41	.75	.66
15	3.40	2.27	3.50	2.40	3.45	2.34	1.11
16	1.65	1.09	1.38	1.45	1.52	1.27	.25
17	2.05	.79	2.01	.86	2.03	.83	1.20
18	1.38	.39	1.37	.88	1.38	.64	.74
19	.89	.42	1.19	1.05	1.04	.74	.30
20	1.30	.75	1.35	.90	1 33	.83	.50

The five tests in which the greatest superiority of the favored school is shown are given here in the order of the amount of difference.

Test number 17, absurd statements, is described by the authors[1] of the Point Scale as primarily a test for 'logical judgment based on imagination, analysis and reasoning.'

Number 15, comprehension of questions, tests 'practical judgment involving memory and imagination.'

Number 19, comparison of familiar objects involves 'analysis and comparison of remembered objects and attention.'

Number 10, concrete definitions, tests 'ideation (association) and analysis.'

Number 5, which shows the fifth greatest difference between the two schools, consists of counting backward from 20 to 1. Here the mental traits involved are 'memory, imagination and attention.' Probably the reason for the higher average score in the favored school is the fact that games involving counting backwards were played by the children of this school and when they were given this test

[1] Point Scale, p. 8.

they knew what was expected, with little explanation; while counting backward seemed a new process for most of the younger children of the unfavored school.

The results of test number 19, abstract definitions, would probably have shown a greater difference between the two schools but for the fact that the average for the unfavored school was raised because a greater number of unfavored children were able to define 'charity.' The familiarity with this term is easily understood, as charity in some form is extremely common in the unfavored district.

With the exception of number 5 it seems, then, that the greatest difference in the performances of the children of the two schools lies in the tests involving primarily analysis and abstraction. This agrees with Binet's analysis of the difference between the scores of the children in the private school at Brussels and those from the poorer section of Paris. Binet found the Belgian children superior in tests involving criticism, comparison, abstract definitions, absurdities, or in those involving thought in the higher sense. He pointed out that some of these tests probably put a premium on the ready use of language and that the children from the higher social class had the advantage in this respect.

The five tests which show the least difference between the two schools will now be considered. Number 8, arranging weights, is described as having to do with 'kinæsthetic judgment, ideation and attention.'

In number 1, æsthetic judgment, the difference between the two schools is also very slight. This is described as having to do with 'æsthetic judgment involving perception, association and analysis.' As this is probably the easiest of all the tests, it was seldom missed by either school, which probably accounts for the small difference in the average scores.

'Motor coördination and visual perception' are the traits involved in Number 12, copying a square and a diamond.

Number 3, comparison of lines and weights, tests 'discrimination' of the visual type in the first part and of the kinæsthetic type in the second.

Number 16, drawing of designs from memory, involves 'visual memory, perception, attention and motor coördination.'

With the exception of number 1 the above tests all involve sensory-motor functions to a great extent and have to do primarily with kinæsthetic judgment and motor coördination.

To summarize: The results from the single tests show the greatest difference in tests involving analysis and abstraction and the least difference in those involving primarily motor coördination and kinæsthetic judgment. This agrees with Thorndike's view that individuals differ least in sensory motor functions and most in analysis and abstraction.[1]

Individual Scores

The individual scores will now be considered as to the number of children who are twenty-five percent above or below the norm of their age, when judged by the general norm and when judged by the average of their own school. Tables IV. and V. show the individual scores by sex and age groups for each school. In each group the number of individuals whose scores depart by twenty-five percent or more

Table XIV

		No.	Percent of Total
Using general norm.	Favored group, 25% below the norm...	3	1.8
	Favored group, 25% above the norm...	73	44.2
	Unfavored group, 25% below the norm.	44	32.4
	Unfavored group, 25% above the norm.	11	8.1
Using separate norms for each school... . ..	Favored group, 25% below the norm...	10	6.2
	Favored group, 25% above the norm..	10	6.2
	Unfavored group, 25% below the norm	19	16.5
	Unfavored group, 25% above the norm	16	13.9

from the norm for that age is indicated. The solid lines indicate the individuals who deviate twenty-five percent or more from the general norm for that age group. The dotted lines indicate the number who deviate twenty-five percent or more from their own group norm. The exact numbers are shown in convenient form in Table XIV.

[1] Thorndike, E. L., 'Educational Psychology,' second edition, 1910, pp. 218–223.

As will be seen, nearly one third of the children of the unfavored school have a coefficient of mental ability of .75 when judged by the general norm. This has been suggested by Dr. T. H. Haines[1] as a criterion of feeble-mindedness. He has shown that it is a more lenient criterion than four years' retardation above the thirteenth year. For the ages here considered it is roughly equal to about two years' retardation. The number of the favored group twenty-five percent or more below the general norm for their age is only 3. On the other hand the favored school shows over 44 percent, twenty-five percent or more above the norm, while the unfavored school has only eight percent. If these results are compared with those of Cambridge[2] where practically the same numbers are twenty-five percent above and below the average, it appears that the unfavored school is greatly weighted by subnormals and the favored school by supernormals. The question now arises whether it is fair to judge both schools by the same standard. Let us see what the results would show if the unfavored and the favored schools were judged by their own norm or average. In this case the standard will of course be lowered for the unfavored group and raised for the favored group. The dotted lines indicate this in Tables IV. and V. The averages of the pupils were only used up to and including nine years, however, for beyond nine years the scores were so low and there were so few cases that a fair average could not be obtained. Up to the ten-year group, then, the number twenty-five percent above and below the norm for each school is about equal, as was the case in the Cambridge schools.

Considering the great number which must be classed as very inferior intellectually, if not feeble-minded, in the unfavored school if the same standard is used for judging both schools, it seems unfair that groups of children from such different social classes should be judged by the same norm. If the sociological factor is not considered in clinical diagnosis, it seems probable that too high a standard will be expected

[1] Haines, T. H., 'Relative Values of Point Scale and Year Scale Measurements of 1,000 Minor Delinquents,' *J. Exp. Psychol.*, 1, 51–82.

[2] Point Scale, p. 55.

of the unfavored individuals and so the degree of mental deficiency which might exist would be overestimated.

Study of Occupations

The children will now be grouped in the two schools by the occupation of the father. The 165 children in the favored school were classified as follows:

(1) Professional group 32
- Professors 17
- Doctors 6
- Lawyers 3
- Editors 3
- Architects 2
- Ministers 1

(2) Proprietors, officers and managers of manufacturies and stores 32
- Proprietors 16
- Managers and officers 11
- Building contractors 5

(3) Traveling salesmen, insurance agents and real estate dealers 39
- Traveling salesmen 33
- Salesmen 5
- Insurance agents 6
- Real estate dealers 6

(4) Clerical workers 21
- Clerks 13
- Bookkeepers and accountants 5
- Cashiers 3

(5) The remaining forty-one children were classified in a miscellaneous group.

The main groups in which the 136 children of the unfavored school were classified are as follows:

(1) Laborers, unskilled 60
This group includes odd-job workers and all unskilled and casual laborers.

(2) Skilled mechanical trades 45
- Railroad engineers and mechanics 13
- Metal workers 12
- Building trades 10
- Electricians 3
- Shoe cutters 3
- Miscellaneous skilled workers 4

(3) Teamsters and delivery men 19

The remaining twelve children in the unfavored school were put in a miscellaneous class.

In comparing the groups in the favored school, the children from one group were matched with children as nearly as

possible the same age in the other group. The results are here shown for the professional group compared with the traveling salesmen. Thirty children from each group were matched in this comparison.

	Av. Chron. Age	Av. Mental Age	C. M. A.
Professional group	7 yr. 7 mo.	9 yr. 8 mo.	1.42
Traveling salesmen	7 yr. 7 mo.	9 yr. 3 mo.	1.26

The average chronological age is thus the same, but the professional group averages 5 months superior to the traveling salesmen group mentally.

The clerical workers were rather a mixed group. Many of the clerks were chief clerks and the group as a whole is small. Comparing seventeen from this group with seventeen from the manager group of corresponding ages, the following results were obtained.

	Av Chron. Age	Av. Mental Age	C. M. A.
Clerical	7 yr. 10 mo.	9 yr. 1 mo.	1.22
Managing class	7 yr. 8 mo.	9 yr. 5 mo.	1.24

The managing class averages two months younger chronologically, but shows about four months' superiority mentally.

In the unfavored school thirty-six children were matched from the skilled and unskilled laboring classes.

	Av. Chron. Age	Av. Mental Age	C. M. A.
Skilled	7 yr. 11 mo.	7 yr. 6 mo.	.93
Unskilled	8 yr. 1 mo.	6 yr. 11 mo.	.80

The unskilled group here has the advantage of being two months older; nevertheless its average mental age is seven months less and its coefficient of mental ability .13 less than the average for the skilled group.

When a group was selected from laborers to match the ages of the eighteen children in the teamster group, the following results were obtained.

	Av. Chron. Age	Av. Mental Age	C. M. A.
Teamsters	7 yr. 10 mo.	7 yr.	.83
Unskilled laborers	7 yr. 10 mo.	7 yr. 2 mo.	.88

The teamsters appear to have as a class an even lower mentality than the unskilled laborers, but this is a very small group and results might be different if larger numbers were compared.

The following is a summary of the results for the various occupation groups, irrespective of schools and ages:

	No.	Av. Chron. Age	Av Mental Age	C. M. A.
Professional	32	7 yr. 3 mo.	9 yr. 8 mo.	1.42
Traveling salesmen	39	7 yr. 6 mo.	9 yr. 2 mo.	1.26
Proprietors, etc.	34	7 yr. 10 mo.	9 yr. 1 mo.	1.21
Skilled	63	8 yr.	7 yr. 10 mo.	1.12
Unskilled	60	8 yr.	7 yr. 1 mo.	.83

It is noteworthy in this table that although the chronological age increases from group to group, the mental age decreases.

Conclusions

Our results corroborate the conclusions of Binet in France, Hoffman in Germany and Yerkes *et al.* in United States that there is a very considerable dependence of intelligence upon sociological condition. We have further shown that when children are classified according to the occupations of their fathers, a striking correlation is shown between intelligence quotient and occupation group. Hence, if mental age rather than chronological age were used to determine the time for beginning school, the children of the professional group, for example, would begin school two years earlier than the children of the unskilled labor group; for the former mature intellectually much earlier than the latter.

Incidentally the results have shown that the correlation of intelligence and social status is probably higher for boys than for girls. The girls of the poorer school are considerably superior to the boys; but the boys of the better school are only at one age noticeably superior to the girls.

The superiority of the better classes is most evident in tests that involve higher mental processes like analysis and abstraction; but it is also shown to a lesser extent in sensory motor functions.

We have not discussed the causes of this relation of intelligence to social status for the very good reason that our data do not contribute anything towards a solution of the problem. They aim merely to establish the fact and amount of the difference, and could be used by adherents of the "Environment Theory" as well as by advocates of "Inheritance." Thus, the former could emphasize the quite evident differences in home and school environments, teaching staff, etc.; while the latter would point to the just as evident differences in the character and intelligence of the parents. It is worth noting that in the few cases where the mothers were tested, they showed a mental age about equivalent to that of their children. If intelligence quotient could be obtained for a number of successive generations with different environments, such data might contribute to a solution of the problem.

We have also omitted discussion of the percentage of feeble-minded in the different social groups, and have concerned ourselves only with the variations in intelligence; for we consider the diagnosis of feeble-mindedness and the measurement of intelligence two quite distinct though related problems that had better not be confused. Diagnosis depends upon a number of other considerations as well as the psychological. The physical aspect can not be wholly neglected; and the importance of the patient's life history is generally acknowledged, especially if amentia is to be distinguished from dementia.

There are also sociological considerations which the advocates of a purely psychological concept of feeble-mindedness must acknowledge as soon as they consider the problem of the dividing line between normal and feeble-minded intelligence. The various criteria: two to four years' retardation, an intelligence quotient below .75, the 'lowest three percent'

of the population,[1] etc., are all ultimately based upon sociological, or socio-legal considerations. They are merely statements of the limits below which an individual fails to attain certain social standards of living.

Now, since these standards of living vary greatly from group to group, it seems only reasonable that the above mentioned limits (and intelligence norms) used in diagnosis should vary too. Otherwise, we might be obliged to classify whole races as feeble-minded. All Hottentots would probably be feeble-minded, if judged by Anglo-Saxon intelligence norms; and similarly the majority of the children of the unskilled labor group might be classed feeble-minded if judged by norms for the professional group. The facts discussed in this paper should therefore find a place among the various considerations upon which careful diagnosis depends; but we have preferred to confine ourselves to the strictly psychological problem: the measurement of the intelligence of different social groups.

[1] Pintner, R. and Paterson, D. G., 'A Psychological Basis for the Diagnosis of Feeble-mindedness,' *J. of Crim. Law and Crim.*, 7, May, 1916.